



# Space News Roundup

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No. 25



JSC Photo by Jack Jacob

**JUNETEENTH FUN**—JSC worker Rosemary Thompson gets the autograph of Charlotte Hornets (and former Houston Rockets) basketball star Robert Reid at Tuesday's annual Juneteenth Picnic. With them are, from left, an unidentified Rockwell employee and Ronald Price. Employees gathered at the Gilruth Recreation Center to honor the date that Texas received the news that slavery had been abolished.

## Bush to push for lunar-Mars funding in '91

By Kelly Humphries

President George Bush put Congress on notice Wednesday that he intends to continue to push for 1991 funding to intensify the lunar and Mars exploration initiative.

Speaking to Marshall Space Flight Center employees, educators and Space Camp participants in Huntsville, Ala., Bush complained about last week's \$300 million cut by the House Appropriations Subcommittee for Space that would "gut seed money for the lunar-Mars mission."

"Right now in the funding wars in Congress, we face a central question: The question of whether America will continue to be a pioneering nation," he said. "Some in Congress appear ready to give up on that pioneering spirit, to turn inward, to concede that America's days as a leader in space have passed. I for one am not ready to give up. America has always been and will always be a nation of pioneers."

Bush invoked the memory of President John F. Kennedy in comparing those uncertain about America's leadership in space with the nay-sayers in Spanish King Ferdinand and Queen Isabella's court.

"Had Columbus waited until all of the problems of his time were solved, the timbers of the Santa Maria would be rotting on the Spanish coast to this very day," the President said.

Modern day school children have shaken their heads in disbelief about such shortsightedness, he said.

"We must not let the children of the future shake their heads at our behavior."

"History tells us what happens to nations that forget how to dream," he added. "The American people want us in space so let us continue the dream for our students, for ourselves and for all humankind."

Bush's remarks came after a tour of Marshall, and an opportunity to talk with Payload Specialists Sam Durrance and Ron Parise from the Payload Operations Control Center during a Spacelab simulation.

He remembered that the last time he had visited Marshall was during his 1987 presidential campaign. He said he promised then to create a



*I for one am not ready to give up. America has always been and will always be a nation of pioneers.*

—President George Bush

National Space Council, begin a Mission to Planet Earth, boost space science and launch a dynamic new program of manned and unmanned exploration. He said he and NASA have made good on those promises.

"We have done it the old fashioned way, done it the American way, step by step, program by program, all adding up to the most ambitious and far-reaching effort since Apollo took America to the Moon."

The President said he remains committed to achieving the goal of having Space Station Freedom in orbit before the century is out, to establishing a permanent lunar base in the next century and to meeting the 30-year deadline he proposed during a speech in Texas last month for landing a human on Mars.

"Being first in space is not just America's dream, it is indeed our destiny," Bush said. "To see this happen, we are matching rhetoric with resources. Our budget proposes \$15.2 billion for NASA, an increase of nearly 25 percent and the largest increase for any major agency of the United States government."

Recalling Wernher von Braun's statement that all that was needed to send a man to the Moon was the will to do it, he called on Congress to have the will needed to continue NASA's robust space exploration program.

"With your work and our support, it is going to happen," he said.

## Mini tanking test planned

Partial liquid hydrogen load to verify absence of leaks

By Kyle Herring

Space shuttle technicians are preparing *Atlantis*, which was rolled to Launch Complex 39A on Monday, for a "mini" liquid hydrogen tanking test next week to verify there is no leak in the orbiter and external tank fuel connections.

The test of the 17-inch disconnect area, similar to one performed on *Columbia* a few weeks ago, will include additional instrumentation to check for unacceptable leak rates in the cavity.

The flight crew for STS-38—Commander Dick Covey, Pilot Frank Culbertson and Mission Specialists Bob Springer, Carl Meade and Sam Gemar—participated in the Terminal Countdown Demonstration Test at Kennedy Space Center this week. The test concluded with simulated ignition of the main engines at 10 a.m. CDT Thursday.

The crew was scheduled to return to Houston Thursday and continue final preflight simulator training at JSC. They will return to KSC three days before launch.

Workers have completed interface verification testing of all connections between the launch pad and vehicle. Work scheduled today and this weekend includes the helium signature check to verify no abnormal leakage

exists in the shuttle's main propulsion system and loading of the onboard fuel tanks.

The payload bay doors have been opened and final cargo bay cleaning is in progress.

"Work on *Atlantis* is proceeding very smoothly toward launch," said Al Branscomb, vehicle manager at JSC. "We haven't had any significant issues since reaching the pad that would impact the launch date."

Launch of *Atlantis* on its seventh flight is currently scheduled for July 14. Shuttle managers will meet next Thursday and Friday in the traditional flight readiness review to assure the vehicle, crew and flight control team are ready for the mission.

Meanwhile, *Columbia* is in the Orbiter Processing Facility awaiting the outcome of testing on its external tank's umbilical to locate the leak that postponed the STS-35 mission to mid-August.

*Discovery* is continuing processing for its next flight to carry the Ulysses solar probe into space in October.

The STS-41 partial stack of the solid rocket boosters, which was transferred to Launch Pad 39B to make room in the VAB for *Columbia*'s rollback, was moved back to the VAB for continued stacking operations for the Ulysses mission.



STS-38

## Robotics experts convene international symposium

By Kelly Humphries

Today at JSC, robotics instrumentation experts from around the world are wrapping up the first International Symposium on Measurement and Control in Robotics, ISMCR '90.

About 400 experts from 30 countries have been at the Gilruth Recreation Center since Wednesday discussing the latest developments in a field that holds the key to important technology needed for Space Station Freedom and advanced planetary exploration.

"Robots are extremely capable and they are going to become more and more capable," said Astronaut Story Musgrave, keynote speaker at Thursday night's ISMCR banquet. "Whether we're exploring a planet

robotically or doing maintenance and repair on the space station, they're going to be working hand in hand with humans.

"But operationally we need to integrate robots into the NASA team early," he said, explaining that he believes the best robot configurations available should be installed and used in the appropriate trainers here. "We need to have one around so that astronauts and flight controllers can work with them and get to know them."

The symposium is being hosted by the Engineering Directorate's new Automation and Robotics Division. It is co-sponsored by the Clear Lake Council of Technical Societies, the

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JSC Electronic Photo by Bob Walck

Participants in the first Director's Forum meeting were, from left, JSC Director Aaron Cohen, Linda McCoy of the Engineering Business Management Office, Cinda Chullen of Engineering's Management Support Office, Diane McLaughlin of Safety, Reliability and Quality Assurance, David Lamar of the Lunar and Mars Exploration Program Office, Cheryl Andrews of MOD's Flight Design Engineering Office, Anh Huynh of Engineering's Automation and Robotics Division, and James Sturm of the Human Resources Office.

## Director's Forum permits candid idea exchange

By Pam Alloway

Participants in Wednesday's first Center Director's Forum were surprised their colleagues shared similar problems, something they were unaware of before they sat down to an informal discussion with JSC Director Aaron Cohen.

"In my opinion this is a wonderful idea that allows young engineers and employees to give center management their perceptions of what's going on at the center," said Cinda Chullen, an engineering alternate technical manager in the Management Support Office.

"The intent of this is to enhance communication between management and employees and I think

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# Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m. to 2 p.m. weekdays.

General Cinema (valid for one year): \$3.75 each.  
AMC Theater (valid until May 1991): \$3.50 each.  
Sea World (San Antonio, year long): adults, \$17.25, (2-day, \$21.95); children (3-11) \$14.75, (2-day, \$18.95).  
Astroworld (valid 1990 season): season, \$39.95; regular, \$15.97; children, \$9.21; Waterworld, \$8.15; 2 day—AW/WW, \$18.47.  
Spaceweek 1990 Banquet (6:30 p.m. July 16, South Shore Harbour Resort & Conference Center): \$35 each (before 7/1/90), \$40 each (after 7/1/90).

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# Gilruth Center News

**EAA badges**—Dependents and spouses may apply for a photo I.D. 6:30 p.m.-9:30 p.m. Monday-Friday.

**Defensive driving**—Course is offered from 8 a.m.-5 p.m. July 21 and Aug. 18; cost is \$15.

**Weight safety**—Required for use of weight room, 8-9:30 p.m. July 11; cost is \$4.

**Men's Open "C" Softball Tournament**—Tournament will be June 30. Entry fee is \$95, limited to 16 teams. Deadline is 6 p.m. June 28.

**Ballroom dance**—Classes begin Aug. 2 and meet every Thursday for eight weeks. Beginning and advanced classes meet 7-8:15 p.m. Intermediate class meets 8:15-9:30 p.m. Cost is \$60 per couple.

**Tennis**—Beginning tennis classes will meet from 5:15-6:45 p.m. Mondays for six weeks; advanced beginner classes will meet Wednesdays from 5:15-6:45 p.m. Lessons begin the week of June 25. Cost is \$32.

**Fall Intercenter Run T-shirts**—T-shirts are in, please present I.D. at Rm. 146.

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# Technical Library News

These new publications are available in the JSC Technical Library, Bldg. 45, Rm. 100.

*Computer Conference on Productivity: A Final Report for the White House Conference on Productivity*, by American Productivity Center.

*Influence Without Authority*, by Allan R. Cohen.

*Starting a High-Tech Company*, (VHS videorecording) by Peter Wallace.

*Software Tools in Pascal*, by Brian W. Kernighan.

*Applications of Expert Systems: Based on the Proceedings of the Second Australian Conference*, Turing Institute Press.

*Mathetica: A System for doing Mathematics by Computer*, by Stephen Wolfram.

*Modern Compressible Flow: With Historical Perspective, 2nd ed.*, by John David Anderson.

*VLSI Technology and Neural Network Chips (VHS videorecording)*, IEEE.

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# Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2.

## Property

Sale/Lease: Seabrook 3-2-2, fenced, 10.5% VA assum., \$58,500 or \$565/mo. Donna, 474-4529 or 282-2847.

Sale: 4 Crystal Beach lots on Bolivar, 50x100/ea., Splendor, TX, owner fin. 921-7212.

Sale: Camino So., 3-2-2A, new roof, trees, FPL, island kitch., patio, \$79,900. x33335 or 488-7490.

Sale: Home on Galv. Bay, Kemah, TX, 5-4, 2 kitch., patio, 30' pier. John, 331-3884 or Tom, 334-2133.

Lease: Pearlard/Dixie Hollow, 3-2-2, FPL, cathedral ceiling, formal DR, split BR, ins. util room, fenced, no pets, \$650/mo. 482-6609.

Rent: Mobile home lot, \$85/mo., \$50/dep., Oklahoma and Kinne, Baciliff. 488-1758.

Sale: House on Caranchua Bay near Palacios, furn., access to boat ramp/pier, \$40K. (409) 543-2052.

Sale: Friendswood 3-2-2, lg. lot, Gunite pool, approx. 2,000 sq. ft., new paint/carpet, fans, \$88,500. x34902 or 996-9128.

Rent: Egret Bay condo, 2-2-2CP, appli., new carpet/paint, no pets, no smoking, \$500/mo. plus dep. Irene, x39043 or 480-9812.

Rent: Lake Travis cabin, priv. boat dock, CA/H, fully equipped accomm. 8, \$425/wkly, \$85/dly. 326-5652.

Lease: Sagemeadow, 4-2-2, fence, FPL, formal DR, pvt. crtyd., avail. after June 29, \$725/mo. plus dep. 480-0667.

Sale: Mobile home on 80x120 lot, 2-2, appli., stor. shed, patio, dbl. wndws. 337-1365.

Sale: 2 lots, Ivanhoe Lakes, camping/fishing/boating, parks, stor. barn on lot, util., \$8,750/both. Ingrid, 333-3348.

Sale: Pasadena, 3-2-3, formals, corner lot, new carpet, \$69K. x37595 or 488-1359.

Sale: 2-1, carpeted, fans, gar./wksph., 17 lots, 17 mi. so. of Livingston. (409) 327-2500 or (409) 365-2848.

Lease: Univ. Trace condo, 1 BR, study, fans, W/D, \$450/mo. plus dep. Barbara, 282-4618.

Rent: Mobile home lot, \$85/mo., \$50 dep., Baker and Kinne, Baciliff. 488-1758.

Sale: 2-2-1 plus 1 CP, townhome in Green Acres, \$64K, \$7K assumes FHA, no approval loan, \$680/mo. plus \$50 maint. fee. Camille, 333-2636.

Sale: 60 acres on Hwy. 80, 3 mi. from Karnes City, TX, 50 mi. from San Antonio; 2-story house on 1.5 lots w/fruit trees in El Campo. 783-9164.

Sale: Dickinson, Sherwood Oaks, brick 4-2-2D, 2,800 sq. ft., FPL, lg. lot, trees, \$109K. x31466 or 534-3932.

Rent: Galv. condo, Seawall & 61st St., sleeps 6, furn., wknd./wk. rates, cable TV. x33479 or 486-0788.

Sale: Waterview lots near NASA, mid \$30's. Don, x38039 or 333-1751.

Rent: 2-story, 2-2.5 townhouse, W/D option, fan, miniblinds, ex. cond., CLC, \$625/mo. plus dep. Kari, 280-2028 or 471-8717.

Sale: Heights, 3-2-2, remod., CA/H, FPL, game room, deck, Tom, x31418.

Sale/Lease: Baywind II condo, 2-2-2, new carpet/miniblinds/paint, FPL, wet bar, W/D, \$525/mo. 280-8796.

## Cars & Trucks

'83 Nissan PU, standard sport, black, well maint., AM/FM, air, orig. owner, sunroof, \$2,800. Pete, 480-8190.

'84 Buick Skyhawk, 63K, runs great, \$2K. Donna, 474-4529.

'74 Mercury Capri, V6, 4-spd., good cond., low mi., \$1,500 or trade for PU in good cond. x36565 or 532-1812.

'81 Pontiac LeMans station wagon, ex. cond., new

tires/front end/brakes/ reb. V6 eng., \$1,200. x33335 or 488-7490.

'82 Plymouth Omni, auto., AC, AM/FM, \$1,100. 940-5005.

'81 Honda Accord LX, 2-dr., 5-spd., perf. motor, \$1,200. 940-5005.

'78 Plymouth Fury, AC, AM/FM cass., good cond., \$975. Bruce, 485-0396.

'87 Toyota PU, 32K mi., 5-spd., new tires, ex. cond., \$6,500. Kelvin, x36921 or 488-8173.

'84 Chrysler Fifth Ave., loaded, 55K mi., \$5,700. Paul, x34232 or 488-5077.

'87 Escort GT, 5-spd., options w/prem. sound., \$4,900. OBO. Bob, x31215.

'88 Nissan Maxima GXE sedan, 4-dr., loaded, sun roof, 64K mi., \$11.5K. Huey, 333-7248 or 480-9544.

'77 Lincoln Towncar, orig. owner, \$1,995. Gail or Ron, 333-3431.

'80 Fiat Spider conv., 57K mi., ex. cond., \$4,200. Mark, 474-2195.

'88 Ford EXP, ex. cond., 34K mi., 2-dr. htchbk., \$6,500. 532-1214.

'88 Ford F-150 Lariat XLT, 6 cyl., 5-spd w/O, 30K mi., \$8,500. Kriss, x33578 or Larry, 334-2173.

'88 Acura Integra LS, 27K mi., PW, PL, AM/FM/cass., ex. cond., \$12,000. OBO. 996-8410.

'84 Jaguar XS, high efficiency, V8, \$13K. OBO. 488-2137.

'88 Nissan 200SX, 18K mi., \$9K. Jan, x37581 or 334-1985.

'87 Ford Mustang LX, ex. cond., loaded, 14K mi., orig. owner, \$6,450. Eric, 480-5717.

'82 Porsche 924, ex. cond., 62K mi., 5-spd., remov. roof, \$6,500. 280-8796.

'80 Pontiac Phoenix, auto., AC, ster., htchbk., good cond. but trans. needs attention, \$675. x30092 or 481-3637.

'63 VW Bus, reb. eng., new clutch, runs well, \$600. Carl, x31531 or 486-7851.

'85 Buick Electra Park Ave., 4-dr., all pwr., ex. cond., 66,400 mi., new tires, \$6,500. 482-1535.

## Cycles

Girl's 16" bike, \$10. 474-4084.

Boysten speed bike, 26" wheels, new, \$75. Pete, 334-2963.

'82 Harley Davidson XLH motorcycle, low mi., elec. start, ex. cond., new batt., \$2,850. x30092 or 481-3637.

## Boats & Planes

'13' Chrysler w/19' mast, \$250; '18' Prindle w/30' mast, \$650. 474-5558.

'26' Yamaha, ex. cond., \$19K; '16' G-Cat, good cond. w/trlr., \$1K. Bryan, x30385 or 335-1559.

'86 17' Thundercraft boat, 140hp, IO, S.S. prop, trlr., 7-pass., ex. cond., \$6,100. 486-4963.

'12' Aquacat Catamaran, new, \$1K. OBO. Karen G. 283-1039 or 488-7498.

'84 21' Rinker, 170hp OMC, cuddly cabin, porta-potty, fish finder, Loran, VHF radio, galv. trlr., \$8,300. x35178 or 944-2394.

'16' Hobie Cat, 2 sets of sails, harnesses/traps, BO over \$1K. John, x38988 or 482-6364.

Dolphin Senior sailboat, big wheel trlr., good cond. Jerry, x34175 or 554-6004.

'79 Renegade 16' ski boat w/140hp Evinrude, SST top, ex. cond., \$3,250. OBO. 333-6868 or 486-7846.

## Audiovisual & Computers

Sure module 201 ceramic mike, \$10; Navy LM-21 freq. meter w/pwr. supply, \$20; BC-348 rec., \$30; two 4-125 tubes, \$12; other ham gear. 921-7212.

Heathkit solid state 22" color TV, \$20; AM/FM tuner, \$10, both need work; child's rec. player, \$5. Samouche, x35053 or 482-0702.

Commodore 64 color monitor, 1541 disk drive, joy stick, SW, printer, \$300. 482-2425.

Star NX-1000 multi-font NLQ printer, IBM compat. w/cable I/F, ex. cond., \$190. Lonnie, 282-2731 or 482-0547.

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# Dates & Data

## Today

**Cafeteria menu**—Special: meat sauce and spaghetti. Entrees: baked scrod, liver and onions, fried shrimp. Soup: seafood gumbo. Vegetables: green beans, buttered broccoli, whipped potatoes.

## Monday

**Cafeteria menu**—Special: wieners with baked beans. Entrees: beef chop suey, breaded cutlet with cream gravy, grilled ham steak. Soup: beef and barley. Vegetables: buttered rice, Brussels sprouts, whipped potatoes.

## Tuesday

**BAPCO meeting**—The Bay Area PC Organization will meet at 7:30 p.m. June 26 at the League City Bank & Trust. For more information call Earl Rubenstein, x34807, or Tom Kelly, 996-5019.

**Cafeteria menu**—Special: pepper steak. Entrees: fried shrimp, pork chop with applesauce, turkey a la king. Soup: celery. Vegetables: au gratin potatoes, breaded squash, buttered spinach.

## Wednesday

**JSC Astronomy Seminar**—The seminar will be a Rice University videotape featuring Dr. Craig Wheller—"Massive Stellar Evolution in the Large Magellanic Cloud" from noon-1 p.m. June 27 in Bldg. 31, Rm. 129. For more information call Al Jackson, x33709.

**Cafeteria menu**—Special: Mexican dinner. Entrees: fried catfish with hush puppies, braised beef ribs. Soup: seafood gumbo. Vegetables: Spanish rice, ranch beans, buttered peas.

## Thursday

**NASACOM meeting**—NASACOM (a Commodore's Users' Group) will meet at 7:30 p.m. June 28 at the Clear Lake Park building. For more informa-

tion, Contact Glenda at x31764.

**Cafeteria menu**—Special: hamburger steak with onion gravy. Entrees: corned beef with cabbage and new potatoes, chicken and dumplings, tamales with chili. Soup: split pea. Vegetables: navy beans, buttered cabbage, green beans.

## June 22

**Cafeteria menu**—Special: barbecue link. Entrees: deviled crabs, broiled codfish, liver and onions. Soup: seafood gumbo. Vegetables: buttered corn, green beans, new potatoes.

## June 30

**Wet and Wild Weekend**—JSC-EAA presents Wet & Wild Weekend 10 a.m.-6 p.m. June 30 or July 1 at Waterworld. Tickets are \$5.50 plus tax.

## July 11

**JSC Astronomy Seminar**—The seminar will be a Rice University videotape featuring Dr. John Imbrie—"Explaining the Ice Ages" at noon-1 p.m. July 11, in Bldg. 31, Rm. 129. For more information contact Al Jackson, x33709.

## July 14

**Lunar Rendezvous Run**—The 12th annual Ford Aerospace Lunar Rendezvous Run will start at 8 a.m. July 14 at the Rec Center. Entry forms are available at the gym office. Entry fee is \$8 if postmarked by June 15, \$10 by July 1, \$12 by July 7, and \$15 after July 7. Those interested in volunteering for the race should contact Len Topolski, 333-5576, or Brenda Clary, 480-0257.

## July 16

**Spaceweek Banquet**—Spaceweek will hold a national banquet at 6:30 p.m. July 16 at the South Shore

Harbour Resort & Conference Center, Crystal Ballroom. Dr. Harrison Schmitt will serve as keynote speaker with an introduction by JSC Director Aaron Cohen. Contact Tanya Lyttle, 333-3627, for more information.

## July 18

**JSC Astronomy Seminar**—The seminar will be an open discussion meeting from noon-1 p.m. July 18 in Bldg. 31, Rm. 129. For more information call Al Jackson, x33709.

## July 24

**BAPCO meeting**—The Bay Area PC Organization (BAPCO) will have its next meeting at 7:30 p.m. July 24 at the League City Bank & Trust. For more information call Earl Rubenstein, x34807, or Tom Kelly, 996-5019.

## July 25

**JSC Astronomy Seminar**—The seminar will be a Rice University videotape featuring Dr. Edison Liang—"Gamma Rays From Nearby Supernovas" from noon-1 p.m., July 25, in Bldg. 31, Rm. 129. For more information call Al Jackson, x33709.

## Aug. 1

**JSC Astronomy Seminar**—The seminar will be an open discussion meeting from noon-1 p.m., Aug. 1, in Bldg. 31, Rm. 129. For more information call Al Jackson, x33709.

## Aug. 8

**JSC Astronomy Seminar**—The seminar will be a Rice University videotape featuring Dr. J. Imbrie—"The Climate Spectrum Over a Range of Periods From 1 Year to 10,000 Years" from noon-1 p.m., Aug. 8, in Bldg. 31, Rm. 129. For more information call Al Jackson at x33709.

## Musical Instruments

Korg Trident MKII, perform. synthesizer, splitable 3 voice, 8 note polyphonic keybd., \$350 or trade for bass amp. x36565 or 532-1812.

'68 Les Paul, brass HW, Di Marzio pickups, dual phase bridge pickup w/hd. case, \$425. Chuck, x32340.

Rogers 5-pc. drum set w/cymbals, cases, ex. cond., \$650. OBO. John, x38871.

Yamaha V50 synthesizer, 16-note/8 voice multi-timbral polyphony, built-in 8-trk. seq., rhythm sec., digital effects, \$1,150. Martin, x31692 or 488-0949.

## Lost & Found

Found bike w/basket near Bldg. 2, Visitors Center, call w/descrip. 486-9620.

## Photographic

Polaroid mini portrait cam., Model 251, uses Polaroid 546 film, \$150. OBO. Michael, x38169.

## Pets & Livestock

Bunnies, 5 wks., also grown rabbits, \$5/ea., some cages. Leah Nappier, x38687.

Yorkie, reg. male, friendly. 488-8198.

AKC min. Schnauzer, fem., free. 482-1505.

Baby cockatiels, grays & pinks, hand fed, hand tamed, hand raised. Linda, 484-7834.

Persian/Himalayan kittens, CFA reg., lilac point, chocolate point, solid lilacs, \$225-300; stud serv., CFA reg. champion chocolate point Himalayan & grand champion blue Persian, pick of litter or neg. fee. x30439 or 334-1154.

8 yr. old app. mare, extremely gentle, \$1,500. x33224 or (409) 986-6641.

AKC reg. Cocker Spaniel pups, 8 1/2 wks. old, first shots, 2 males, 1 fem., \$150/ea. Leli, x36502 or 481-8858.

Pure bred Chihuahua pups, 6 wks. old, \$150. x34768 or 488-3563.

AKC reg. min. fem. Dachshund, 2 red, 1 blk./tan, 6 wks. old, \$150/ea. 554-4839.

Free cat, 1 yr. old neut. fem., all shots, very affec. x35056 or 474-4132.

Free puppies, del. date approx. July 4, sire mixed Beagle, bitch mixed Dachshund. Aaron Brown. 944-0493.

Brn. ringneck raindoves, \$2/ea. Clarence Blume, x38820 or 554-2911.

AKC Collie pups, whelped April 26, great fam. dogs., \$175-200. 482-8647.

Fem. Calico cat, shots, spayed, declawed. Teena, x37797.

## Wanted

Want used Nintendo games. Jeff, 282-7744 or 996-1907.

Want fem. roommate to share house in Sagemont area, \$300, all util. pd. Beverly, 484-2523.

Want leftover, unwanted gar. sale items, no junk. 339-1337.

Want 2 wndw. AC units, pref. working. 339-1337.

Want fem. roommate to share 3 BR duplex w/1 or 2 other fem. Jans, 338-2588 or 283-4262.

Want carpools from Kingwood/Humble area. Latonya Bailey, x39232 or 360-1835.

Want part time waitress, call in as needed, some exp. needed. Gilruth Center, x30326.

Want players for wargames group, conflict simulation historical strategy games, The Longest Day, TSS Gettysburg, Edward, x36250.

Want fem. w/BR set to share 2 BR/den townhouse in CL, \$420, no util. 486-0174.

# Fast Facts

## Distribution network lets engineers work with minutes-old flight data right at their desks

By James Hartsfield

**A** year-old network that links the Mission Control Center (MCC) with engineering offices now allows engineers to check the performance of shuttle subsystems during a flight without leaving their desks.

The Shuttle Flight Data Distribution System (SFDDS) makes near real-time telemetry from the shuttle available to subsystem managers, increasing their efficiency by cutting down the amount of time needed to see how equipment is functioning. Previously, engineers had access to such data only by visiting the Mission Evaluation Room (MER) in the MCC.

In addition to information that is sometimes just 15 minutes old, the network can supply historical information on a system's performance. The only access engineers had to historical data previously was through the Orbiter Data Reduction Center, a cumbersome process where the data could be delivered on microfiche, paper or computer tape, but not electronically.

The network debuted during shuttle mission STS-29, and it has steadily gained popularity through the ensuing flights. "Not everyone needs to use it, but there are subsystem managers who now rely on it. And with every mission, you see its use increase," said Reid Farley, project manager for the SFDDS.

"Our intention, in part, was to limit the number of people at the MER. We had large numbers of people going over there to get

data," Farley said. "It's been a very positive response. It's cut down on the amount of time that an engineer had to spend waiting for the information he needed. Now, they can sit at their desks and peruse information on their subsystems periodically."

Although flight controllers in the MCC make the decisions concerning equipment problems in flight, data concerning a problem also is studied by the engineers who are experts in the area and can recommend a course of action. Many such studies are conducted in the MER, but the room cannot be staffed by the hundreds of engineers responsible for the various shuttle systems.

"Basically, engineers need data, not necessarily real-time, but reasonably quickly. Now we have a broader, more enlightened set of engineers who can follow the progress of a mission," Farley said. "Also, analytical programs and routines stored in the engineers' personal computers can be used on the data."

The data is distributed via a link between the Flight Support Host (FSH) computer in

the MCC and the Johnson Space Center Engineering and Science Network (JESNET). Anyone with access to JESNET, even off-site, can request near real-time data during a flight, although strict security measures are in place to protect against infiltration.

"The networks were all in place, we just had to supply the links," he said. "But we had to have software added for the security

system. It's the first time such a link has been made with the FSH in mission control, and security required a lot of work."

Farley said the link could not have been made without the cooperation and support of Freddie Jones in the Mission Operations

Directorate's Facility and Support Systems Division and Jerry Milhoan, Ed Kasper and James Allen of the Mission Support Directorate.

"It was quite a feat just to coordinate among all these organizations and their contractors," he said.

Most of the hardware used to set up the distribution was off-the-shelf, commercially

available equipment, keeping the cost of implementation down. "I think it's been a bargain," Farley said. "And the manpower savings it provides are invaluable."

To gain access, a potential user must register prior to a flight and be assigned an identification the system will recognize. To register, interested parties should contact Lockheed's project engineer Paul Wilson at 333-6717.

"We took elaborate steps to ensure that the system is very secure," said Mike Gaudiano chief of the Instrumentation and Processor Applications Branch. "Every transaction is monitored and tracked. The system must recognize a user's name and terminal before it will respond."

In fact, the security precautions were among the most difficult aspects of setting up the distribution, Farley said.

Still, the system is used only for unclassified shuttle missions, and not Department of Defense-dedicated flights.

"What we had before was an antiquated system that we lived with for years because there was nothing better," Farley added.

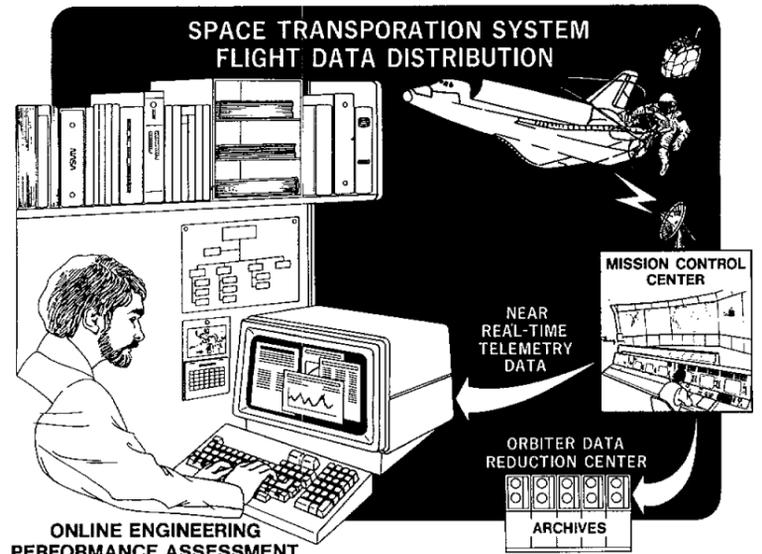
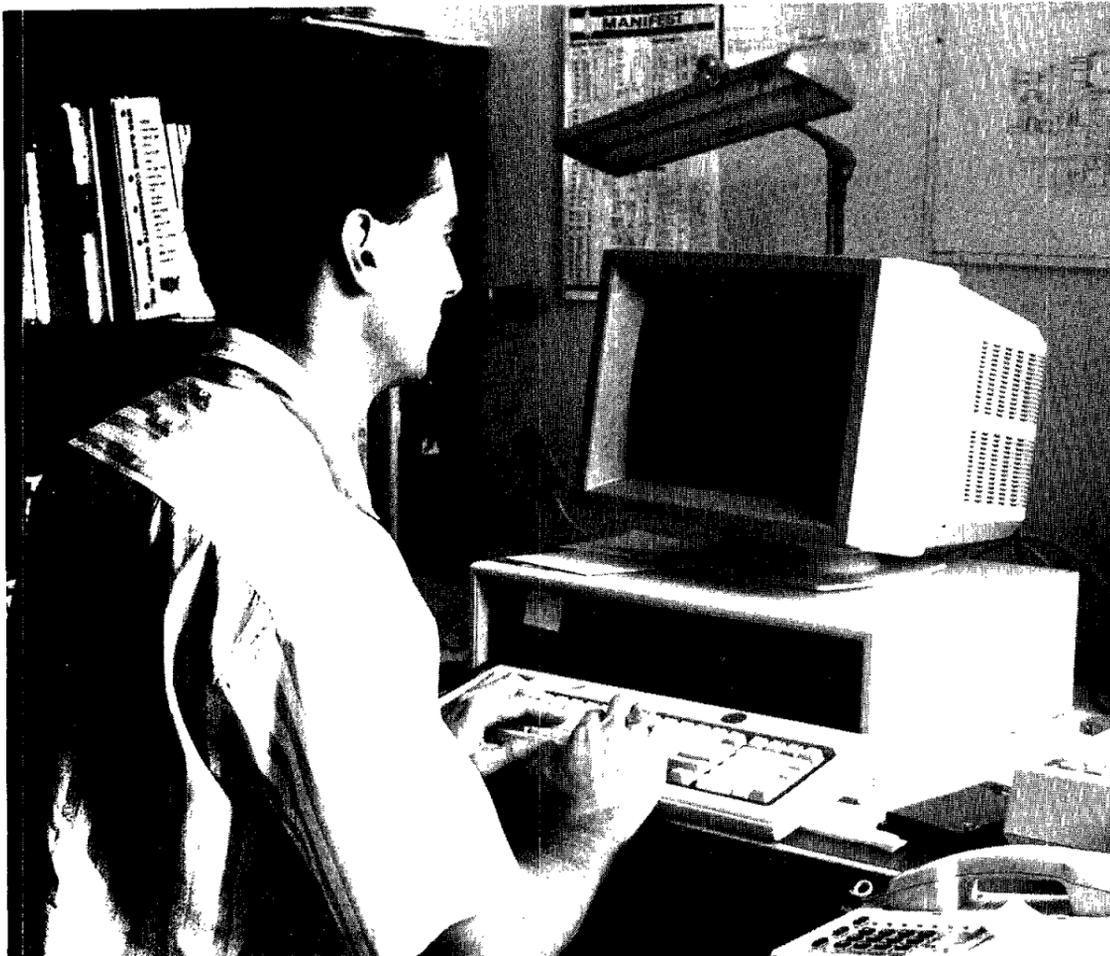
"This is infinitely better." The driving force behind its installation was the expansion of the Engineering Directorate's hands-on role in shuttle support following the *Challenger* accident, he said.

"The flexibility of the system has since fostered a desire for real-time data. Although not part of the original design, it can be added with few modifications. At times, people have had a clear need for it," Gaudiano said.



*What we had before was an antiquated system that we lived with for years because there was nothing better. This is infinitely better.*

—Reid Farley, SFDDS Project Manager



JSC Photos and Illustration

Top: The team that put together the Shuttle Flight Data Distribution System included, background, from left: Bob Sager and Stephen Ren, both of IBM; Paul Wilson, Lockheed; Ed Kasper, Mission Support Directorate (MSD); Project Manager Reid Farley; Jerry Poel, Lockheed; James Allen, MSD; Kandy Lawson, IBM; Freddie Jones, Mission Operations Directorate; and Hardy Williams, Lockheed. In the foreground, from left, are: Lakshmi Allam and Elena Clark, both of Lockheed, and Jay McFarland, IBM. At left, a young engineer works with some of the near real-time data available through the network.

# NASA awards fellowships to Texas Space Grant students

By Kari Fluegel

NASA's partnership with education grows stronger as JSC continues to support and advise 23 state universities through the Texas Space Grant Consortium.

The most recent step in encouraging the future aerospace professionals occurred when, as part of the overall effort, the Texas Space Grant Consortium awarded \$5,000 fellowships to 18 students at various member universities across the state.

The Texas Space Grant Consortium was organized in August 1989 when NASA Administrator Richard Truly selected universities and con-

sortia across the United States as recipients of up to \$225,000 grants for outreach activities.

The program, introduced to Congress in 1987 by Sen. Lloyd Bentsen, D-Texas, is patterned after the Land and Sea Grant College programs to foster a "broad commitment and intense involvement on the part of the federal government in partnerships between state and local governments, private industry, universities, technical organizations and industry concerned with the exploration and utilization of space."

JSC is not a member of the 23-member Texas Space Grant Consortium but serves as a general adviser

to the members of the group, said Dr. Stan Goldstein, JSC's director of University Programs.

The university members of the Texas consortium are Texas A&M University, Baylor University, Lamar University, Prairie View A&M University, Rice University, Southern Methodist University, Texas A&I University, Texas A&M at Galveston, Texas Southern University, Texas Christian University, Texas Tech University, University of Texas at Austin, UT-Arlington, UT-Dallas, UT-San Antonio, UT-El Paso, U-Medical Branch at Galveston, UT Health Science Center-Houston, UT Health Science Center-San Antonio, UT Southwest-

ern Medical Center-Dallas, University of Houston, UH-Clear Lake and UH-Downtown.

"The basic purpose of this cooperation is to help reverse the steadily shrinking pool of trained scientists and engineers," Goldstein said.

The act establishes a network of universities to promote increased understanding, development and use of aerospace science and technology; broadens the base of universities contributing to related fields; promotes cooperative efforts among universities, industry and government leading to integrated programs of aerospace education, training, research and advisory service; and

helps recruit and educate professionals allied fields.

Phase II of the program will begin during the next few months and will draw in states not already participating by selecting state consortia to become involved in Space Grant Program Grants or Capability Enhancement Grants.

The first will target states with some aerospace activities for outreach programs to strengthen their capabilities for future involvement, Goldstein said. The second will target states with little or no aerospace activities to develop aerospace and research capabilities, he said.

## Exceptional undergrads work at JSC

Fourteen exceptional students on NASA scholarships from historically black colleges are working at JSC this summer under a new program designed to boost science and engineering study among minorities.

Under the 3-year-old program, students are selected for the NASA Scholars Program after demonstrating high scholastic abilities and a desire to major in engineering, mathematics, physics or other sciences related to NASA's mission.

"It's been a challenge, but I enjoy it very much," said Latoya Bailey, who is working for 10 weeks in the Crew and Thermal Systems Division. "It has brightened my horizons in regard to the space station and everything else NASA is involved in."

This is the second summer at JSC for Bailey, a junior majoring in chemistry and chemical engineering at Spelman College and Georgia Tech. She is working at the Air Membrane Test Stand in Bldg. 7, testing membranes for air recycling use in the space shuttle, and working with the regenerative life support system designs that would use plants to recycle the space station's atmosphere. Last year, she worked at Ellington Field.

Bailey said her experiences here have encouraged her to seek a job with NASA when she graduates.

Three other students are from Spelman College, Atlanta. Four are from Morehouse College, Atlanta. Six are from Florida A&M University, Tallahassee.

JSC is participating in the program in an effort to increase the number of minority employees it hires in jobs. An expected shortfall of scientists and engineers by the year 2000 has spurred NASA—the largest government employer of people in those disciplines—to try to overcome the trends. One way NASA is doing that is by concentrating on groups traditionally underrepresented in those fields: women, minorities and people with disabilities.

The NASA Scholars Program, managed at JSC by the Equal Opportunity Program Office, is designed to encourage minorities to pursue careers in those fields instead of turning away from science and mathematics courses early in life. Freda Marks, Federal Women's Program manager, is coordinator.



Photo by JSC Television Office

In a scene from the videotape, **Safety, Reliability and Quality Assurance Director Charles Harlan discusses how important a continuing quality improvement effort is to mission safety.**

## Quality improvement video chronicles JSC's progress

JSC's quality improvement efforts will be showcased next week in an Office of Management and Budget (OMB) video produced for national distribution by the JSC Television Office.

The JSC segment of the half-hour video, featuring more than a dozen JSC employees, highlights Team Excellence, Strategic Planning and Culture Survey activities.

The video will be broadcast at 9:15 a.m., 1:15 p.m. and 3:15 p.m. daily the week of June 25 on Channel 12 of JSC's Closed Circuit Television system. It also will be available for viewing at 1:15 p.m. Tuesday in the Bldg. 30 auditorium.

The program spotlights the three 1990 winners of the OMB Quality

Improvement Prototype award: JSC, the Defense Industrial Supply Center in Philadelphia and the IRS Cincinnati Service Center in Covington, Ky. The award recognizes federal organizations that are working toward the highest standards of quality, efficiency and timeliness, and uses them as examples for other agencies.

Prepared by the winners, the tape was first shown at the third annual Conference on Federal Quality and Productivity Improvement in Washington, D.C., May 30-June 1 when JSC Director Aaron Cohen, Management Analysis Office Chief Les Sullivan and Team Excellence Coordinator Wanda Thrower accepted the award.

## Forum lets director, employees compare viewpoints

(Continued from Page 1) that's wonderful," she said.

Ideas flowed both ways.

"We talked about a number of items," Cohen said. "They provided me with some ideas of how to improve the center. Among the ideas were ways of obtaining more efficiency and ways of providing better communication."

The monthly forum resulted from employee and Culture Survey suggestions for improved management-employee communication.

Cohen met with six of the "top

performers" from across the center to discuss issues of mutual concern involving the center and the agency. At the top of the list were concerns voiced by both participants and Cohen about staffing needs and meeting the challenge of juggling space shuttle, space station and future technology work with limited resources.

"It was pretty interesting to hear the same opinions from across the directorates," said Linda McCoy, Engineering Business Management Office program analyst. "Mr. Cohen was well informed about the issues as we

perceived them. It was pleasing to me that top-level management indeed was really aware of issues yet willing to listen to our point of view on them."

Diane McLaughlin, an aerospace engineer in the Vehicle Reliability Engineering Branch of the Safety, Reliability and Quality Assurance Office, agreed.

"I was fascinated when we got to talking about how many organizations have a manpower crunch... what with the flight schedule increasing and space station coming on board," McLaughlin said. "He did a great job

getting us started and I think the small group provided a good setting for shaking some interesting ideas out and confirming you're on the right track about some concerns."

Cheryl Andrews, an orbit design engineer in Mission Operations' Flight Design Engineering Office, hoped to discuss ways in which JSC could become more involved in the community such as in continued recycling efforts.

James Sturm and Karl Schuler of Human Resources helped design the forum.

## Space News Roundup

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## Correction

An incorrect toll-free telephone number for Space Exploration Initiative (SEI) Outreach literature was given to the June 15 issue of Space News Roundup.

The correct number people may call to request an SEI Outreach response packet is 1-800-677-7796.

The number has been established by the RAND Corp., Santa Monica, Calif., which is conducting the initial evaluation of responses to NASA's program to solicit innovative ideas for lunar and Mars missions.

NASA Administrator Richard Truly last week announced the appointment of Lt. Gen. Thomas P. Stafford to head the Outreach Program.

## Commercial experiment transporter gets support

NASA has announced support for plans to develop a system to launch and recover commercial spaceborne experiments.

Sponsored by the Office of Commercial Programs, the objective of the Commercial Experiment Transporter (COMET) program is to develop both hardware and infrastructure to facilitate the commercial development of space.

NASA's Centers for the Commercial Development of Space (CCDS) initiated the program and will be totally responsible for system design, fabrication, test and operations in which industry will be encouraged to be innovative.

Carried aloft by an expendable

launch vehicle, the COMET free-flyer will contain both a service module and a recovery system. The two components will separate prior to reentering the atmosphere so that most experiments will be returned to Earth in the recovery system, while others not requiring retrieval, could continue their mission aboard the service module.

There are six major elements to the COMET program: launch vehicle and services, payload integration, the service module, orbital operations, recovery system and services, and systems engineering. Contractors will be expected to provide key hardware and services for each segment of COMET development and operations.

The COMET program plans call for a mid-1992 launch of a free-flyer, weighing up to 1,800 pounds, into an orbit with an inclination of about 40 degrees. Commercial experiments and processes to be returned to Earth will be carried out during a 30-day mission, while non-recoverable payloads can remain on orbit in the service module for a year or longer. Specific launch and recovery locations have not been defined.

The lead CCDS, the Center for Advanced Space Propulsion (CASP) at the University of Tennessee Space Institute, Tullahoma, will be responsible for program management and systems engineering.